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# Balancing localization and globalization: exploring the impact of globalization on an opto/photonics cluster

Richard De Martino

David Reid

Stelios Zyglidopoulos

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## **Balancing Localization and Globalization: Exploring the impact of globalization on an opto/photonics cluster**

Academy of International Business  
2002 Annual Meeting  
San Juan, Puerto Rico  
2.2.3 Theme Workshop  
Clustering in High Technology Industries  
Time: Saturday 10:30 a.m. --to 12:00

Richard De Martino, College of Business, Rochester Institute of Technology  
David McHardy Reid, College of Business, Rochester Institute of Technology  
Stelios C. Zyglidopoulos, College of Business, Rochester Institute of Technology

Rochester Institute of Technology  
College of Business  
108 Max Lowenthal Building  
Rochester, NY 14623-5608  
Email: rxdbbu@rit.edu

### *Abstract*

*This paper reports the finds of an exploratory study on the impact of globalization on regional industrial clusters. The past decade has witnessed the popularization of two somewhat contradictory trends in geographic competitiveness: the importance of localization and globalization. This paper reports the preliminary findings of research conducted on the internationalization of the optics/photonics clusters based in Rochester, NY. Twenty-two senior executives were interviewed, face-to-face. Using content analysis combined with a grounded theory influenced approach the texts of these interviews were appraised. A number of salient findings emerged regarding relationships among localization, internationalization, and firm capacity.*

### **Introduction**

The past decade has witnessed a dramatic increase in the popularity of the concept of "industrial clusters". This concept has been presented as a panacea for a variety of issues related to international competitiveness, trade performance, economic development, etc. While definitions differ, advocates of industrial cluster uniformly note the competitive strengths of firms operating in close geographic proximity who pursue close cooperative relationships with local competitors, suppliers, academic institutions, and others. In its most recently popularized version by Michael Porter (1998) clusters are defined as "a geographic concentration of interconnected companies, specialized suppliers, service providers, associated institutions and firms in related industries".

The notion that competitive industrial strength derives from regional/local relationships and embeddedness, however, conflicts with other observations related to the competitive strengths of internationalization, particularly in the areas of technology transfer and end user markets. This apparent contradiction has led to a small but growing interest in the impact of globalization on the interactions associated with firms located in well-established industrial clusters. Their objective has been to determine if the impetus and orientation of firms located in distinct clusters is shifting from local to international relationships and networks. Thus far, the results of these studies have been inconclusive and methodologically focused on formal relationships as opposed to a balance of formal and informal relationships.

The purpose of this research is to contribute to the understanding of the impact of globalization on industrial clusters. It employs grounded theory and analyzes a well-accepted high technology industrial cluster: the optics and photonics industry based in Rochester, New York. The opto/photonics industry was

chosen, in part, because it represents a unique and generalizable proxy of other high technology clusters based in non-dominant economic regions throughout the developed world. Whereas regions such as the Silicon Valley have had numerous interrelated and supporting industries and end-user networks, the vast majority of high technology clusters exist in technologically advanced regions that lack complete end user value chains.

This project entailed interviewing the senior executives and/or founders of 22 of the most significant opto photonics firms in the region with the intent of uncovering “how” and “if” local relationships are influenced by globalization. The following are the preliminary results of an ongoing project with a completion date targeted toward the first quarter of 2003.

The paper is organized in the following fashion. The first section defines the concept of industrial clusters and provides a basic literature review on the attributes associated with local cluster environments. Next, a brief review of previous studies exploring the shift from local to international linkages. The literature review is followed by a methodology section, brief industry history, and preliminary findings. The findings are further divided into Taxonomy of Companies, Institutional Structures and Firm Size, Local and External Collaborative Relationships, and Ongoing Trends Toward Internationalization. The paper concludes with a brief summary of the preliminary findings.

## **Initial Observations**

This study was designed to test a number of implicit hypotheses regarding the relationship between local cluster economies and globalization. As with most high technology districts and clusters the Rochester opto/photonics industry has steadily internationalized over the decade. This internationalization was hypothesized to be in some way impacting existing local relationships. A preliminary exploration of the data suggests that these two influences may be indirectly related. Content analysis suggests that a firm's establishment of non-local operations on any scale—national or international—may weaken the degree of embeddedness within a region. Equally, the acquisition of local companies by outside entities may also lead to the same outcome.

External growth and acquisition allow firms greater access to outside (non-local) networks, resources, and technologies. Equally important, these forces allow firms to create or be integrated into “internal infrastructures” that allow for internal economies of scale. With greater resources and options, local firms may then rationally choose the extent and degree of collaboration and interaction. In some sense the life cycle and growth stages of a business appears to be the primary factors influencing a firm's choices and ability to determine how closely to work with local institutions and firms. Under these circumstances, local relationships and embeddedness are balanced against non-local relationships—whether international or national in scope. When firms are small, resource poor, or lacking in external networks, they seek the most inexpensive and readily available assistance through local networks. As internal infrastructure develops and non-local networks emerge these companies seek to re-balance their local and non-local relationships—gaining benefits from the local economy where it is most advantageous.

The competitive enhancing influences of local cluster environments and globalization have traditionally been viewed as separate phenomena. This exploratory study has sought to analyze from a firm level perspective the interaction and balance of these two forces. It has observed that the balance of local and non-local interaction is determined in part by a firm's internal capacity and strategy. Further research exploring each of these relationships is required.

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Academic Interaction  
Table 5

Company	Type of Product	Academic Interaction	Wholly Owned or Outside Facilities
L	Photonics Subsystems	Medium-Local	No
D	Photonics Subsystems	High-Local	No
M	Photonics Subsystems	None	No
N	Photonics Subsystems	Low-Local*	No
A	Photonics Value Added	None	No
O	Photonics Value Added	High-Local	No
Q	Photonics Value Added	Low-Local	No
S	Photonics Value Added	Low-Local	No
R	Photonics Subsystems	High-Local	No
I	Photonics Subsystems	High-Local	No
E	Photonics Value Added	High-Mixed	Yes
F	Photonics Value Added	High-Regional	Yes
G	Photonics Value Added	Low-Mixed	Yes
K	Photonics Value Added	High-Mixed	Yes
U	Photonics Value Added	High-Mixed	Yes
V	Photonics Value Added	High-Mixed	Yes
B	Precision Optics	Trade School-Local	No
C	Precision Optics	Trade School-Mixed	Yes
W	Precision Optics	Trade School-Local	No

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*This paper seeks to understand the impact of globalization on regional industrial clusters. The past decade has witnessed the popularization of two somewhat contradictory trends in geographic competitiveness: the importance of localization and globalization. While previous research has sought to understand and analyze how the multinational enterprises seek localization in order to capture critical expertise and resources, to date, no efforts have sought to explore how globalization impacts "cluster" relationships among locally-based, embedded firms. This paper reports the preliminary findings of research conducted on the internationalization of an optics/photonics cluster. Twenty-two senior executives were interviewed, face-to-face. Using content analysis combined with a grounded theory influenced approach the texts of these interviews were appraised. A number of salient findings emerged regarding relationships among localization, internationalization, and firm capacity.*

### **Authors: Biographical Sketches**

Richard DeMartino is an Assistant Professor of Management in the College of Business at the Rochester Institute of Technology (RIT). Formerly a currency risk trader, Richard conducts research and teaches in the areas of entrepreneurship and international environments.

David McHardy Reid is the Benjamin Forman Chair of International Business at RIT and is an Honorary Professor of The University of Hong Kong School of Business. In the last decade David has been, primarily, researching the strategies of foreign companies in Asia, and has interviewed around 350 CEO's in: Japan, China, Korea, Thailand, Malaysia, Indonesia and Burma. He has published widely on this subject.

Stelios C. Zyglidopoulos is Assistant Professor at the College of Business at RIT. He has been previously affiliated with the Faculty of Business Administration of Erasmus University in Rotterdam, and has graduated from the Faculty of Management of McGill University. He has published articles in a number of management journals, including the Journal of Management Studies, Business & Society, and Organization.